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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/782,687	02/12/2001	Jafar Savoj	019717-001110US	4983

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EXAMINER	
CURS, NATHAN M	
ART UNIT	**PAPER NUMBER**
2633	11

DATE MAILED: 06/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/782,687	SAVOJ, JAFAR	
	Examiner	Art Unit	
	Nathan Curs	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 March 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1-20* is/are allowed.

6)☒ Claim(s) *21-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 February 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *6, 7 and 10*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Farjad-Rad et al. (US Patent No. 5799048) in view of Van Paemel ("Analysis of a charge-pump PLL: a new model"; Van Paemel; IEEE Transactions on Communications, Vol. 42, Issue 7, July 1994, Pages 2490-2498).

Regarding claim 21, Farjad-Rad et al. disclose a clock and data recovery apparatus comprising: a voltage controlled oscillator, configured to provide a clock signal at a clock output (fig. 3, elements 22 and CLK1); a half-rate phase detector comprising a data input, configured to receive a data input signal having a data rate and a data pattern (fig. 3, element DATA; fig. 4, element DATA; col. 1, lines 8-10 and col. 4, lines 12-20), and a clock input coupled to the clock output of the voltage controlled oscillator, configured to receive the clock signal (fig. 3, elements CLK1, CLK2, 32, 34, 40 and 42); a charge pump between the half-rate phase detector and the voltage controlled oscillator, which inputs transitioning signals and outputs a voltage level (fig. 3, element 20, and col. 1, lines 51-61), where the charge pump module inherently includes a low-pass filter following the charge pump circuit in order to integrate the transitioning input signals and output a voltage level. Farjad-Rad et al. also disclose that the clock signal has a frequency which is half the data rate (col. 4, lines 12-20), and the half-rate phase detector provides a first

signal (fig. 3, element X1) and a second signal (fig. 3, element X2), the first signal dependent on the phase difference between the data input signal and the clock signal, and also dependent on the data pattern (col. 4, lines 12-20), the second signal dependent on the data pattern (col. 4, lines 52-61). Farjad-Rad et al. disclose that the charge pump combines the first and second signals to generate an output signal that is dependent on the phase difference (col. 1, lines 51-61) and disclose that the charge pump may be of any suitable conventional design, but do not disclose all the details of the charge pump, specifically that the charge pump is not dependent on the data pattern. Van Paemel disclose a conventional charge pump, where the output of the charge pump is dependent on the phase difference of the two input signals to the phase detector and not on the data pattern (figs. 4 and 5 and page 2491, col. 1, line 1 to col. 2, line 7). It would have been obvious to one of ordinary skill in the art at the time of the invention to use a conventional charge pump in the circuit of Farjad-Rad et al., as taught by Farjad-Rad, et al., such as the conventional charge pump disclosed by Van Paemel, whose output is dependent on the phase difference of the input signals and not the data pattern.

Regarding claim 22, Farjad-Rad et al. in view of Van Paemel disclose that the charge pump generates the output signal by subtracting the second signal from the first signal (Van Paemel: fig. 4, element U, D and ip, and page 2491, col. 1, line 1 to col. 2, line 7).

Regarding claim 23, Farjad-Rad et al. disclose that the clock signal has approximately a fifty percent duty cycle (Farjad-Rad et al.: fig. 4, element CLK1).

3. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Farjad-Rad et al. (US Patent No. 5799048) in view of Van Paemel ("Analysis of a charge-pump PLL: a new model"; Van Paemel; IEEE Transactions on Communications, Vol. 42, Issue 7, July 1994,

Pages 2490-2498), as applied to claims 21-23 above, and further in view of Dalmia (US Patent No. 6211741).

Regarding claim 24, Farjad-Rad et al. in view of Van Paemel disclose a voltage controlled oscillator, but do not disclose that the voltage controlled oscillator comprises a ring oscillator. Dalmia discloses a phase-locked loop including a half-rate phase detector and a ring oscillator VCO (col. 2, lines 33-40 and lines 58-60; and col. 5, lines 36-42). It would have been obvious to one skilled in the art at the time of the invention to use the ring oscillator disclosed by Dalmia in the voltage controlled oscillator of Farjad-Rad et al. for generating complementary half-rate clock signals.

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Allowable Subject Matter

5. Claims 1-20 are allowed.

Conclusion

6. Any inquiry concerning this communication from the examiner should be directed to N. Curs whose telephone number is (703) 305-0370. The examiner can normally be reached M-F (from 9 AM to 5 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan, can be reached at (703) 305-4729. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4700.

JASON CHAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600